REMARKS/ ARGUMENTS

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Applicants assert that the present invention is new, non-obvious and useful. Favorable reconsideration and allowance of the application is respectfully requested.

Remarks/ arguments to claims objections/rejections

Status of Claims

Claims 1-7, 10, and 13-14 are pending in the application.

Claims 1-7 and 10 have been rejected.

Claims 1 and 6 have been amended.

Claims 8-9 and 11-12 have been cancelled.

Claims 13-14 have been added.

Applicant respectfully asserts that the amendments to the claims add no new matter.

Election/Restriction

In response to the restriction requirement under 35 U.S.C. § 121, the Applicants provisionally elect for continued prosecution of the Group I claims (i.e., claims 1-7 and 10) drawn to the method of manufacturing flexible magnetic tape without traverse. Thus, the Applicants request examination of claims 1-7 and 10.

To advance prosecution, Applicant has cancelled claims 8-9 and 11-12 without prejudice or disclaimer. The Applicants expressly reserve the right to file a divisional application with respect to these claims at a later date.

35 U.S.C. §112 Rejection

Claim 1 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which the Applicants regards as the invention. The Applicants have amended Claim 1 to recite "to a ~~first~~ magnetic field". Therefore, the Applicants submit that the rejection of Claim 1 under 35 U.S.C. §112, second paragraph, has been overcome and should be withdrawn.

35 U.S.C. §103(a) Rejection

Claims 1, 6-7, and 10 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lee (U.S. Patent No. 4.023.204) in view of Miklos (U.S. Patent No. 3,873,975).

In response, the Applicants amended independent Claim 1, which requires, inter alia, the steps of:

> providing a flexible elongated substrate with a layer of material having a permanently structured magnetic characteristic which varies in a first direction making an oblique angle relative to a longest dimension of the substrate;
>
> coating the substrate with a slurry comprising anisotropic magnetic particles;
>
> moving the substrate and slurry coating relative to a magnetic field having a field strength which varies with time in a second direction making an oblique angle with the first direction;
>
> orienting, in response to moving the substrate, the magnetic particles on selected spaced areas of the substrate in a second direction making an oblique angle with the first direction, whereby the magnetic particles oriented in the second direction are overlaid on top of the permanently structured magnetic characteristic which varies in the first direction; and
>
> solidifying the slurry to fix the magnetic particles in place;
>
> wherein points on the tape are uniquely identifiable by a single linear movement of a read head.

Support for this amendment can be found in the Specification as originally filed at paragraphs [0013] - [0015] and FIGs. 3-4.

The Applicants have also amended independent Claim 6, which requires, inter alia, the steps of:

> a) coating a flexible substrate with a slurry comprising anisotropic magnetic particles;
>
> b) moving the substrate and slurry coating relative to a first magnetic field having a field strength which varies with time in a first direction;
>
> c)orienting, in response to the moving, the magnetic particles in a first direction, whereby the particles oriented in the first direction produce a detectable pattern oriented in the first direction;
>
> d) subsequently moving the substrate and slurry coating relative to a second magnetic field having a field strength which varies with time in a second direction making an oblique angle with the first direction;
>
> e) orienting, in response to the subsequently moving, a subset of the magnetic particles on selected spaced areas of the substrate in a second direction making an oblique angle with the first direction, whereby the subset of the particles oriented in the second direction produce a detectable pattern in the second direction which is superimposed over the detectable pattern oriented in the first direction;
>
> f) solidifying the slurry to fix the said particles in place;
>
> characterized in that the first magnetic field has a magnetic field strength which varies with time in said first direction, such that following step e) the magnetic particles are selectively oriented in spaced areas in both said first and said further directions; and
>
> wherein the first detectable pattern and the second detectable pattern are uniquely identifiable by a single linear movement of a read head.

Support for this amendment can be found in the Specification as originally filed at paragraphs [0013] - [0015] and FIGs. 3-4.

Lee teaches a magnetic record media that includes a layer of magnetically anisotropic particles. These particles are permanently aligned with their easy axes of magnetization in

adjacent areas of the medium predominately on a respective one of two inclined directions. A transport means is provided for relative motion of the medium, along its length, and a recording head, aligning a gap of the recording head and the medium to have equal inclination to each of said directions. The head is energized to create a magnetic field for magnetizing the medium in accordance with information to be recorded. Lee also teaches that resolved components of remnant magnetism produced by adjacent areas of said equally magnetized medium in the direction in which the recording head gap is aligned are substantially equal.

The Examiner on page 5 of the present Office Action states that Lee teaches:

> a) providing a flexible elongate substrate with a layer of material having a permanently structured magnetic characteristic which varies in first direction making an oblique angle relative to the longest dimension of the substrate;
> b) coating the said substrate with a slurry comprising anisotropic magnetic particles;
> c) moving the substrate and slurry coating relative to a first magnetic field having a field strength making an oblique angle with the first direction, thereby orienting the said particles on selected spaced areas of the substrate in a second direction making an oblique angle with the first direction; d) solidifying the slurry to fix the said particles in place (col1, lines 55-68; col 2, lines 1-53).

The Applicants respectfully suggest that the Examiner is misunderstanding the claim language of "first direction" and "second direction" with respect to the teaching of Lee. For example, Lee teaches "two different oblique directions". This refers to the two different directions of particle orientation which build up to form the Watermark "bar code" of Lee. However, in the present invention, there are actually two Watermark bar-codes which are overlaid at different angles, and the "second direction" refers to the angle of the second bar code.

The Applicants have amended Claim 1 and Claim 6 to more clearly recite this distinction. For example, independent Claim 1 now more clearly recites:

> orienting, in response to moving the substrate, the ~~said~~ magnetic particles on selected spaced areas of the substrate in a second direction making an oblique angle with the first direction, whereby the magnetic particles oriented in the second direction are overlaid on top of the permanently structured magnetic

characteristic which varies in the first direct;

and independent Claim 6 now more clearly recites:

> orienting, in response to the subsequently moving, a subset of the ~~said~~ magnetic particles on selected spaced areas of the substrate in a second direction making an oblique angle with the first direction, whereby the subset of the particles oriented in the second direction produce a detectable pattern in the second direction which is superimposed over the detectable pattern oriented in the first direction;

The differences between Lee and the present invention can also be seen in the following figures.

FIG. 1a

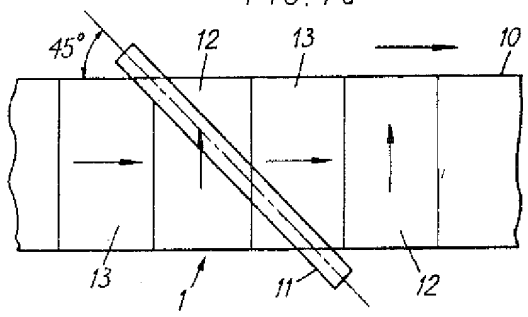
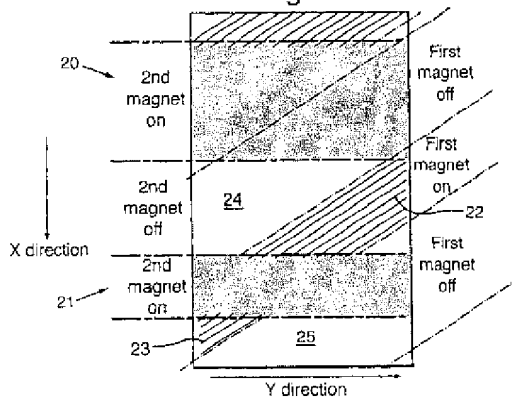


Fig.4.



Present Invention

As can be seen from the above figures, Lee merely shows that particles can be orientated in two different directions to create a single watermark. The present invention, on the other hand, shows how two detectable patterns such as (but not limited to) watermarks can be created. Taking the method described in Claim 6 as an example: a first subset of particles is oriented in a first direction forming a first detectable pattern such as (but not limited to) a set of bands at a first angle. A second subset of particles is oriented in a second direction, forming a second detectable pattern such as (but not limited to) a second set of bands at a second angle that is different than the first angle. As FIG.4 shows, this second subset of particles can include some (but not all) of the particles from the first subset. Those particles which are members of both the first and the second subsets are oriented as members of the first subset and then re-oriented to a different angle as members of the second subset. It should be noted that the re-orientation dominates because it is the last magnetic field that the particles experience before they are solidified. This example can (if desired) be repeated with appropriate changes in wording to describe the equivalent process for Claim 1. An important point for the Examiner to consider, as shown in the example above given by FIG. 4 of the Specification as originally filed, is that the horizontal banding, which is made by a second magnet, is superimposed on the diagonal banding, which is

made by the first magnet (or other modulation means such as metal or thickness of the magnetic layer). Nowhere does Lee teach or suggest this. Lee only teaches a single magnetic head with a variable field.

The present invention is advantageous because the two bar codes created by superimposing particles oriented in different directions can contain incrementing numbers which allow them to act as tape-measures in the X and Y directions, as shown in FIG. 4 of the Specification as originally filed. The present invention can use a three-state modulation to read both of these bar-codes with a single pass of a single read head. Two of the states are two angles of particle orientation, and the third state being one of three options a) random particle orientation; b) metal layer; or c) modulation of the thickness of the magnetic oxide layer. These three options are easily detectable by the same head and read circuit which can be used to sense the Watermark Magnetics particle orientation. These features allow an appropriately-sized patch of tape to be cut out of the parent web at any location, and this patch can then be read by a single "swipe" to accurately pinpoint its location on the parent web, thus making each patch uniquely identifiable.

It should be noted that "random" particle orientation refers to the orientation of particles that are coated onto the substrate, but which are not subjected to any strong magnetic field before being solidified. This random orientation occurs in those selectively spaced regions which pass over both electromagnets while they are not energized. In these regions the particles are mostly randomly oriented, although there may be a small degree of orientation (known in the art as "flow orientation"), which depends on the exact method of coating, but is generally much smaller than the degree of orientation that can be produced by magnetic fields. Thus, this "random" state of orientation can form a third state, which is distinguishable by the reader from the two angles of magnetic orientation.

The above tape-measure analogy mentions three options (a, b, c) for producing the third

state of modulation. It may be useful to note that Claim 6 corresponds to option (a), Claim 2 corresponds to option (b), and Claim 4 corresponds to option (c).

With respect to Claim 6, the Applicants would like to also point out that Lee does not teach "...a second magnetic field having a field strength which varies with time in a second direction..." as Lee only teaches a single magnetic head.

Accordingly, the present invention distinguishes over Lee for at least the reasons given above.

The Examiner on page 5 of the present Office Action correctly states that Lee does not teach "the first magnetic field that varies with time in a second direction". However, the Examiner goes on to combine Lee with Miklos stating:

> Miklos et al discloses a first magnetic field that varies with time in a second direction (col 2, lines 40-44). It would have been obvious to one with ordinary skill in the art to include the first magnetic field that varies with time in a second direction because Miklos et al discloses selective (Sic) magnetization as a security feature (col 2, lines 1-34).

Miklos teaches a system and method for authenticating and interrogating a magnetic record medium. In particular, Miklos teaches that a magnetic field is produced along a track parallel to the physical alignment of the magnetizable material within selected locations to magnetize the material within the selected locations. Miklos also teaches that at least a portion of the material in the remainder of the layer adjacent the selected locations is magnetized differently depending upon the physical alignment of the material along the track. The magnetization of the magnetized material along the parallel track is then sensed to provide a first signal representative of the selected locations. A magnetic field is also produced along a track transverse to the physical alignment of the magnetizable material within the selected locations to magnetize the material within the selected locations. At least a portion of the material within the remainder of the layer adjacent the selected locations is magnetized differently depending upon

the physical alignment of the material along the transverse track. The magnetization of the magnetized material along the transverse track is then sensed to provide a second signal representative of the selected locations, after which the authenticity of the document is established by comparing the amplitudes of the two signals so produced.

Independent Claim 1, on the other hand, recites:

> [...]
> moving the substrate and slurry coating relative to a magnetic field having a field strength which varies with time in a second direction making an oblique angle with the first direction;
> orienting, in response to moving the substrate, the magnetic particles on selected spaced areas of the substrate in a second direction making an oblique angle with the first direction, whereby the magnetic particles oriented in the second direction are overlaid on top of the permanently structured magnetic characteristic which varies in the first direction;
> [...]

and independent Claim 6, on the other hand recites

> [...]
> d) subsequently moving the substrate and slurry coating relative to a second magnetic field having a field strength which varies with time in a second direction making an oblique angle with the first direction;
> e) orienting, in response to the subsequently moving, a subset of the magnetic particles on selected spaced areas of the substrate in a second direction making an oblique angle with the first direction, whereby the subset of the particles oriented in the second direction produce a detectable pattern in the second direction which is superimposed over the detectable pattern oriented in the first direction;
> [...]

Miklos is completely silent on these claim elements. In fact Miklos explicitly teaches that "In making the record medium, as just described, it is preferred to first physically align all the magnetizable particles in one direction and then to differently physically align the particles at selected locations transverse to the one direction." See Miklos at col. 2, lines 46-50.

Furthermore, Miklos generally teaches "a plurality of electromagnets ... selectively energized". However, the teachings and drawing of Miklos make it quite clear that Miklos is not teaching a two-dimensional tape measure. The reading method taught by Miklos in FIG. 5 shows five read heads operating in the long direction of the card, and a further head-pair (numbered 110 and 111) scan the card from side to side, with the card then being indexed in the long direction.

The method of making tape using a rotary-cylinder containing magnets taught by Miklos is incapable of producing the flexible magnetic tape having a permanently structured magnetic characteristic which varies from place to place in two different directions in the plane of the tape as claimed by the present invention. In fact, the method taught by Miklos has the incidental disadvantage that it causes migration of a large amount of the particles in the wet oxide, which will swim towards the areas of highest magnetic field. With respect to the alternative method taught by Miklos col. 6, line 45 to col.7, line 10 indicate that electromagnets 86-94 are selectively magnetized. However electromagnet 102 is not selectively energized. Furthermore, in the Miklos electromagnet method there will be substantial guard-bands in the coated web, at which a patch of tape could be cut out and there would be insufficient information on it for any unique identification of that patch by a reader.

Accordingly, the present invention distinguishes over Lee individually and/or in combination with Miklos for at least the reasons given above. Therefore, in view of the foregoing remarks, the Applicants believe that the rejection of Claims 1, 6-7, and 10 under 35 U.S.C. § 103(a) has been overcome. Claims 7 and 10 depend from Claim 7. Since dependent claims include all of the limitations of their independent claim, Claims 7 and 10 also recite in allowable form. Accordingly, the Applicants request that the Examiner withdraw the rejection and allow Claims 1, 6-7, and 10.

Claims 2-5 are rejected under 35 U.S.C. §103(a) as being unpatentable over Lee (U.S. Patent No. 4.023.204) in view of Miklos (U.S. Patent No. 3,873,975) and in further view of

Litman (U.S. Patent No5,834,748.

The remarks and arguments made above with respect to independent Claim 1 and independent Claim 6 are likewise applicable here and will not be repeated. Furthermore, nowhere does Litman teach or suggest:

> a) coating a flexible substrate with a slurry comprising anisotropic magnetic particles;
>
> b) moving the substrate and slurry coating relative to a first magnetic field;
>
> c)orienting, in response to the moving, the magnetic particles in a first direction;
>
> d) subsequently moving the substrate and slurry coating relative to a second magnetic field having a field strength which varies with time in a second direction making an oblique angle with the first direction;
>
> e) orienting, in response to the subsequently moving, a subset of the magnetic particles on selected spaced areas of the substrate in a second direction making an oblique angle with the first direction, whereby the subset of the said particles oriented in the second direction are superimposed over the said particles oriented in the first direction;
>
> f) solidifying the slurry to fix the said particles in place;
>
> characterized in that the first magnetic field has a magnetic field strength which varies with time in said first direction, such that following step e) the magnetic particles are selectively oriented in spaced areas in both said first and said further directions.

Accordingly, the present invention distinguishes over Lee individually and/or in combination with Miklos and/or in combination with Litman. Claims 2-5 depend from Claim and since dependent claims include all of the limitations of their independent claim, Claims 2-5 also recite in allowable form. Accordingly, the Applicants request that the Examiner withdraw the rejection and allow Claims 2-5.

Furthermore, the Applicants have added new claims 13-14. New Claim 13 recites:

> moving the substrate and slurry coating relative to a third magnetic field having a field strength which varies with time in a direction that is one of
>
> parallel to the first direction, and

oblique to the first direction and second direction; and

orienting a subset of the subset of magnetic particles oriented in the second direction on selected spaced areas of the substrate in a direction that is one of

parallel to the first direction, and

oblique to the first direction and second direction.

New Claim 14, which recites language similar to independent Claim 6, recites:

A flexible magnetic tape having a permanently structured magnetic characteristic which varies from place to place in two different directions in a plane of the tape, the flexible magnetic tape comprising:

a flexible substrate comprising a solidified slurry including anisotropic magnetic particles, wherein a first set of the magnetic particles are oriented by a first magnetic field in a first direction, whereby the first set of particles oriented in the first direction produce a detectable pattern oriented in the first direction, and wherein a second set of the magnetic particles are oriented by a second magnetic field in a second direction making an oblique angle with the first direction, whereby the second set of particles oriented in the second direction produce a detectable pattern in the second direction which is superimposed over the detectable pattern oriented in the first direction.

Lee individually and/or in combination with Miklos and/or in combination with Litman does not teach or suggest the subject matter of new Claims 13-14. Therefore, new Claims 13-14 should be allowed as well.

Conclusion

The foregoing is submitted as a full and complete response to the Official Action mailed September 13, 2007 and it is suggested that Claims 1-7, 10,and 13-14 are in condition for allowance. Reconsideration of the rejection is requested. Allowance of Claims 1-7, 10, and 13-14 is earnestly solicited.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless Applicant has argued herein that such amendment was made to distinguish over a

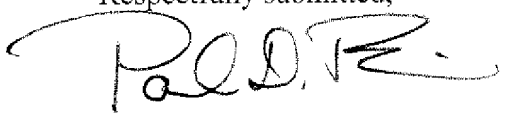
particular reference or combination of references.

Applicant acknowledges the continuing duty of candor and good faith to disclose information known to be material to the examination of this application. In accordance with 37 CFR § 1.56, all such information is dutifully made of record. The foreseeable equivalents of any territory surrendered by amendment are limited to the territory taught by the information of record. No other territory afforded by the doctrine of equivalents is knowingly surrendered and everything else is unforeseeable at the time of this Response by the Applicant and his attorneys.

The Commissioner is hereby authorized to charge any fees that may be required or credit any overpayment to 500601.

If any questions remain regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

Respectfully submitted,



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